ethylene/vinyl cyclohexene copolymer (EVCH), ethylene/cyclohexenylmethyl acrylate copolymer (ECHA), or cyclohexenylmethyl acrylate homopolymer (CHAA).

REMARKS

1. Status of claims

Upon entry of the above amendments, claims 1-4, 6-23, 25-62, and 64-78 are pending, and claims 1-3, 6-7, 9-22, 25-26, 28-50, 52, 56-62, 64-72, and 74-78 are under consideration.

2. Support for amendments

The above amendment of the abstract presents the same text in a form requested by the Examiner. No new matter has been added. A copy of the amended abstract, with insertions and deletions indicated by underlining and brackets, respectively, is attached hereto as Appendix A.

The above amendments of the claims incorporate limitations previously recited by dependent claims 5, 24, and 63 into independent claims 1, 20, 59, and 60, and correct the dependencies of dependent claims that were formerly dependent on claims which are now cancelled. No new matter has been added. A copy of the amended claims, with insertions and deletions indicated by underlining and brackets, respectively, is attached hereto as Appendix B.

3. Miscellaneous points

The Examiner requests correction of the abstract. Upon entry of the above amendment, the abstract is in the form of a single paragraph. Therefore, Applicants believe an adequate correction has been made.

Also, Applicants wish to draw the Examiner's attention to the preliminary amendment filed February 22, 2001, in which a claim for continuing status as a continuation-in-part of copending parent application 09/575,094, filed on May 19, 2000, was made.

4. Claim rejections under 35 U.S.C. §112, second paragraph

Claims 1-3, 5-7, 9-22, 24-26, 28-50, 52-72, and 74-78 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

First, the Examiner alleges the term "oxygen scavenging polymer" renders the claims indefinite because any organic material will react with oxygen given enough time. Applicants respectfully traverse this rejection. In light of the present specification, one of ordinary skill in the art will recognize that the oxygen scavenging polymers recited by the present claims are primarily of interest in packaging applications (e.g., p. 5, line 27-p. 6, line 2). One of ordinary skill in the art will recognize that organic materials which have, for example, an excessively long induction period, an excessively low oxygen scavenging capacity, an excessively low oxygen scavenging rate, or any combination thereof, will not consume oxygen to an extent useful in a packaging application. One of ordinary skill in the art will understand that an organic material which would not be useful in a packaging application would not be an "oxygen scavenging polymer" as that term is used herein.

Second, the Examiner alleges the term "insoluble" (as used in claim 11, among others) is unclear because solubility is a function of the material in which the solute is dissolved. Applicants respectfully traverse this rejection. "Insolubility" of an oxygen scavenging polymer is clarified by the specification at p. 11, lines 3-7, as referring to a polymer which, upon blending with an oxygen barrier polymer, would give rise to a heterogeneous blend of the two polymers,

and not a homogeneous blend. One f ordinary skill in the art can readily recognize whether a blend of two polymers is heterogeneous or homogeneous, and therefore the term "insoluble" is clear.

5. Claim rejections under 35 U.S.C. §103

The Examiner has rejected claims 1-3, 5-7, 9-22, 24-26, 28-50, 52-72, and 74-78 under 35 U.S.C. §103(a) as being unpatentable over Bansleben et al., U.S. Pat. No. 6,255,248 ("Bansleben"), in view of Cahill et al., U.S. Pat. No. 6,083,585 ("Cahill"). Insofar as this rejection applies to pending claims 1-3, 6-7, 9-22, 25-26, 28-50, 52, 56-62, 64-72, and 74-78, Applicants respectfully traverse this rejection.

The claims, as amended, recite blends comprising oxygen barrier polymers and oxygen scavenging polymers comprising an ethylenic backbone and at least one cyclic olefinic pendant group having structure I. Neither Bansleben nor Cahill, nor their combination, teaches or suggests such oxygen scavenging polymers.

Bansleben teaches oxygen scavenging copolymers comprising units derived from strained cyclic alkylenes, with the oxygen scavenging property provided by the strained configuration of the units derived from cyclic alkylene (col. 3, lines 21-22). Although Bansleben teaches that other units may additionally be present (e.g., vinyl cyclohexene, col. 3, lines 57-61), the reference teaches that units derived from strained cyclic alkylene units impart oxygen scavenging properties to copolymers comprising such units. Thus, Bansleben teaches away from the present claims, in which polymers comprising cyclic olefinic pendant groups having structure I possess oxygen scavenging properties.

Cahill teaches condensation copolymers comprising polyolefin oligomer segments (Abstract). Cahill teaches a polyolefin oligomer segment as the portion of the copolymer that imparts oxygen scavenging properties to the polymer (col. 10, lines 46-49). Cahill does not teach cyclic olefinic pendant groups having structure I as part of the oxygen scavenging polymer.

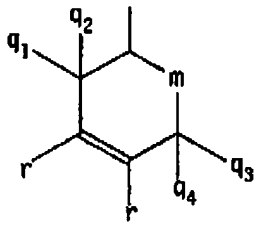
Regarding the combination of the references, first, given that Bansleben teaches addition copolymers derived from at least ethylene and a strained cyclic alkylene (col. 2, lines 25-27) and Cahill teaches condensation copolymers, there is no motivation to one of ordinary skill in the art to combine the references. Even if, accepted strictly for the sake of argument, such motivation existed, neither reference teaches cyclic olefinic pendant groups having structure I as the primary source of the oxygen scavenging properties of a polymer, and therefore their combination cannot either.

For all the foregoing reasons, Applicants are of the opinion that pending claims 1-3, 6-7, 9-22, 25-26, 28-50, 52, 56-62, 64-72, and 74-78 are patentable over Bansleben and Cahill, and request this rejection be withdrawn.

6. Rejections for double patenting

First, claims 1-3, 5-7, 9-22, 24-26, 28-50, 52-72, and 74-78 are provisionally rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 4-11, 15, 17-27, 30, 37, 41, 43-66, 70, 71, 74, 76-80, 84, 86-88, 90-98, 102-113, and 115 of copending application Ser. No. 09/666,642. Insofar as this rejection applies to pending claims 1-3, 6-7, 9-22, 25-26, 28-50, 52, 56-62, 64-72, and 74-78, Applicants will defer filing a terminal disclaimer or taking other action on this point until allowable sets of claims have been established in both the present case and Ser. No. 09/666,642.

Second, claims 1-3, 20, 22, 49-50, 52, and 59 are provisionally rejected under 35 U.S.C. §101 as claiming the same invention as that of claims 1-3, 28, 29, 72, 73, 75, and 89 of copending application Ser. No. 09/666,642. Applicants wish to point out that by the above amendments, the claims of the present application are limited to oxygen scavenging polymers comprising a cycloalkenyl group having the structure I:



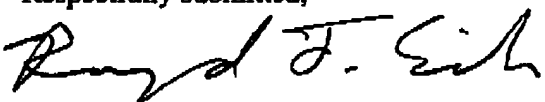
(I)

wherein q_1, q_2, q_3, q_4, and r are independently selected from hydrogen, methyl, or ethyl; m is $-(CH_2)_n-$, wherein n is an integer from 0 to 4, inclusive; and, when r is hydrogen, at least one of q_1, q_2, q_3, and q_4 is also hydrogen, whereas the relevant claims of 09/666,642 are or will be limited to oxygen scavenging polymers comprising an ethylenic backbone and at least one cyclic olefinic pendant group. Therefore, the subject matter claimed by the present application differs from that claimed by 09/666,642, and Applicants request this provisional rejection under 35 U.S.C. §101 be withdrawn.

7. Conclusion

In conclusion, Applicants maintain all pending claims under consideration, viz., claims 1-3, 6-7, 9-22, 25-26, 28-50, 52, 56-62, 64-72, and 74-78, are in condition for allowance. The Examiner is invited to contact the undersigned patent agent at (713) 934-4065 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,



Raymund F. Eich
Reg. No. 42,508

AGENT FOR APPLICANTS

WILLIAMS, MORGAN & AMERSON, P.C.
7676 Hillmont, Suite 250
Houston, Texas 77040
(713) 934-4065
(713) 934-7011 (fax)

June 10, 2002

APPENDIX A

Amendments to specification

Abstract, p. 42:

Herein is disclosed an oxygen barrier composition comprising an oxygen barrier polymer and an oxygen scavenging polymer. The composition can be in the form of a physical blend or a cross-linked blend, and can further comprise a compatibilizer, a transesterification catalyst, or both. Preferably, the oxygen barrier polymer is poly(ethylene/vinyl alcohol) (EVOH), polyethylene terephthalate (PET), or polyamide other than MXD6, and the oxygen scavenging polymer comprises an ethylenic backbone and a pendant cyclic olefinic group. The oxygen barrier composition can be formed into an oxygen barrier layer of a packaging article. Such layers and articles, and methods for making same, are also disclosed.

[The oxygen barrier composition can be formed into an oxygen barrier layer of a packaging article. Such layers and articles, and methods for making same, are also disclosed.]

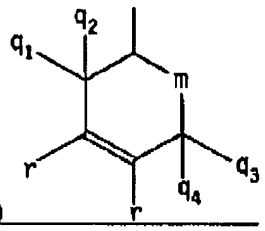
APPENDIX B

Amendments to claims

1. (Amended) An oxygen barrier composition, comprising:

an oxygen barrier polymer, an oxygen scavenging polymer, and an oxidation catalyst,

wherein the oxygen scavenging polymer comprises a cycloalkenyl group having the structure I:



(I)

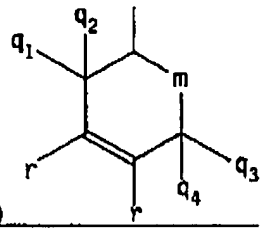
wherein q_1, q_2, q_3, q_4, and r are independently selected from hydrogen, methyl, or ethyl; m is $-(CH_2)_n-$, wherein n is an integer from 0 to 4, inclusive; and, when r is hydrogen, at least one of q_1, q_2, q_3, and q_4 is also hydrogen.

6. (Amended) The composition of claim [5] 1, wherein the oxygen scavenging polymer is selected from ethylene/methyl acrylate/cyclohexenylmethyl acrylate terpolymer (EMCM), ethylene/vinyl cyclohexene copolymer (EVCH), ethylene/cyclohexenylmethyl acrylate copolymer (ECHA), or cyclohexenylmethyl acrylate homopolymer (CHAA).

20. (Amended) A packaging article, comprising:

at least one oxygen barrier layer comprising an oxygen barrier polymer and an oxygen scavenging polymer,

wherein the oxygen scavenging polymer comprises a cycloalkenyl group having the structure I:



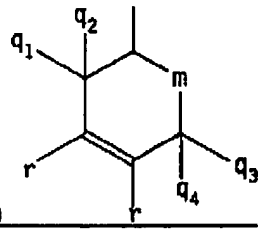
(I)

wherein q_1, q_2, q_3, q_4, and r are independently selected from hydrogen, methyl, or ethyl; m is $-(CH_2)_n-$, wherein n is an integer from 0 to 4, inclusive; and, when r is hydrogen, at least one of q_1, q_2, q_3, and q_4 is also hydrogen.

25. (Amended) The packaging article of claim [24] 20, wherein the oxygen scavenging polymer is selected from ethylene/methyl acrylate/cyclohexenylmethyl acrylate terpolymer (EMCM), ethylene/vinyl cyclohexene copolymer (EVCH), ethylene/cyclohexenylmethyl acrylate copolymer (ECHA), or cyclohexenylmethyl acrylate homopolymer (CHAA).

59. (Amended) A method of making an oxygen barrier composition comprising an oxygen barrier polymer and an oxygen scavenging polymer, wherein the oxygen scavenging polymer is present as an insoluble filler, comprising:

providing the oxygen barrier polymer and the oxygen scavenging polymer, wherein the oxygen scavenging polymer comprises a cycloalkenyl group having the structure I:



(I)

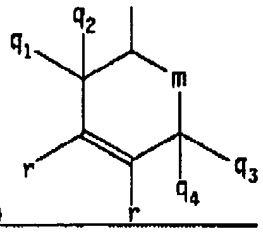
wherein q_1, q_2, q_3, q_4, and r are independently selected from hydrogen, methyl, or ethyl; m is $-(CH_2)_n-$, wherein n is an integer from 0 to 4, inclusive; and, when r is hydrogen, at least one of q_1, q_2, q_3, and q_4 is also hydrogen;

cross-linking the oxygen scavenging polymer with itself, to form an insoluble oxygen scavenging polymer; and

mixing the oxygen barrier polymer and the insoluble oxygen scavenging polymer, to form the oxygen barrier composition.

60. (Amended) A method of forming an oxygen barrier layer in a packaging article, comprising:

providing an oxygen barrier composition comprising an oxygen barrier polymer and an oxygen scavenging polymer, wherein the oxygen scavenging polymer comprises a cycloalkenyl group having the structure I:



(I)

wherein q_1, q_2, q_3, q_4, and r are independently selected from hydrogen, methyl, or ethyl; m is $-(CH_2)_n-$, wherein n is an integer from 0 to 4, inclusive; and, when r is hydrogen, at least one of q_1, q_2, q_3, and q_4 is also hydrogen; and

forming the composition into the packaging article or an oxygen barrier layer thereof.

64. (Amended) The method of claim [63] 60, wherein the oxygen scavenging polymer is selected from ethylene/methyl acrylate/cyclohexenylmethyl acrylate terpolymer (EMCM), ethylene/vinyl cyclohexene copolymer (EVCH), ethylene/cyclohexenylmethyl acrylate copolymer (ECHA), or cyclohexenylmethyl acrylate homopolymer (CHAA).